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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,580	02/25/2002	Yutaka Ueno	219975US2S	8724

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EXAMINER

NGUYEN, DILINH P

ART UNIT PAPER NUMBER

2814

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/080,580

Applicant(s)

UENO, YUTAKA

Examiner

DiLinh Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase: "...the metal layer is short of the side of the substrate..." is not understood.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatsuka et al. (U.S. Pat. 5752182) in view of Bayan et al. (U.S. Pat. 6399415).

Nakatsuka et al. disclose a semiconductor device (fig. 2, column 5, lines 15 et seq.) comprising:

a substrate 122;

a semiconductor chip 101 arranged on the substrate;

a concave portion provided on a side of the substrate (abstract), the concave portion extending from a back of the substrate and terminating in the substrate.

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Nakatsuka et al. fail to disclose a first electrode formed in the substrate and a metal layer formed on the at least part of the first electrode.

Bayan et al. disclose a semiconductor device (fig. 3B, column 3, lines 17 et seq.) comprising:

- a substrate 200 (column 3, lines 64 et seq.);
- a semiconductor chip arranged on the substrate;
- a first electrode 209 formed in the substrate and connected to the semiconductor chip;
- a metal layer (the upper protruding portion of the electrode 209) formed on the at least part of the first electrode.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Nakatsuka et al. to result in shortened path for signal transmission and prevent molding material from forming under the electrode, as shown by Bayan et al.

- Regarding claims 8-9, Nakatsuka et al. disclose the chip 101 comprises an active element and a passive element (column 6, lines 1-5).
- Regarding claim 10, Bayan et al. disclose a sealing resin 225 formed on the substrate, the semiconductor chip and the first electrode.
- Regarding claim 11, it would have been obvious to one having ordinary skill in the art to form the sealing resin includes a magnetic substance.

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- Regarding claim 12, Bayan et al. disclose a second electrode 207 formed in the substrate separately from the first electrode, and the semiconductor chip being arranged on a top of the second electrode.
- Regarding claim 13, Bayan et al. disclose the chip and the first electrode are connected to each other through a bonding wire 222.
- Regarding claim 14, Nakatsuka et al. disclose the concave portion is one of a semicircle.
- Regarding claim 15, Bayan et al. disclose the semiconductor device comprises a leadless package structure (abstract).

5. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatsuka et al. (U.S. Pat. 5752182) in view of Bayan et al. (U.S. Pat. 6399415) and further in view of Selna (U.S. Pat. 5741729).

Nakatsuka et al. and Bayan et al. fail to disclose a multiplayer substrate including at least two layers.

Selna discloses a semiconductor device (cover fig.) comprising:

a multiplayer substrate including at least two layers. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Nakatsuka et al. and Bayan et al. to reduce ground bounce for chip current sourcing as well as chip current sinking and to improve in thermal dissipation for the semiconductor device, as shown by Selna.

- Regarding claims 4-7, it would have been an obvious matter of design choice to form the concave portion in the lowermost layer of the multiplayer substrate or

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the concave portion in the multiplayer substrate including an uppermost layer of the multiplayer substrate.

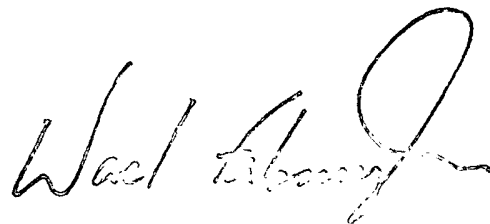
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN
April 24, 2003

A handwritten signature in black ink, appearing to read "Wael Fahmy". The signature is fluid and cursive, with a large loop at the end.

SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800